

Patent claims

1. A cooling plate (1, 16), consisting of copper or low-alloy copper alloy, for metallurgical furnaces
5 provided with an outer furnace casing plate (2), having at least one, preferably at least two, coolant passages (5) which run inside the cooling plate (1, 16), coolant pipe sections (6) for coolant to flow in and out being led to the outside through the furnace casing plate
10 (2), wherein the cooling plate (1, 16) is provided with holding pipes (7) which are led to the outside through the furnace casing plate (2) and which, after they have been passed through the furnace casing plate (2), are provided with securing elements (10), in particular
15 holding plates or holding disks, and the holding pipes (7) and the securing elements (10) being made from a material which has an increased strength compared to copper or low-alloy copper alloy.
- 20 2. The cooling plate (1, 16) as claimed in claim 1, which is connected to the furnace casing plate (2) in a central region by means of a fixed-point securing element (12).
- 25 3. The cooling plate (1, 16) as claimed in claim 2, which - in particular with a cooling plate (1, 16) height/width ratio of ≥ 3 - is provided with at least one movable-point securing element (13) which is arranged above and/or below the fixed-point securing
30 element (12) and allows mobility only in the vertical direction.
4. The cooling plate (1, 16) as claimed in claim 1, which - in particular with a cooling plate (1, 16)
35 height/width ratio of < 3 , preferably < 2 - is provided with at least one moveable-point securing element (13) which is arranged to the left and/or to the right of the fixed-point securing element (12) and allows mobility only in the horizontal direction.

5. The cooling plate (1, 16) as claimed in one of claims 1 to 4, which has tongues (3) and grooves on the side which faces the interior of the furnace, the tongues (3) being segmented in their longitudinal direction.

6. The cooling plate (1, 16) as claimed in one of claims 1 to 5, wherein a holding pipe (7) - in each case surrounding a coolant pipe section (6) - is secured, for example screwed or welded, to the cooling plate (1, 16).

7. The cooling plate (1, 16) as claimed in one of claims 1 to 6, wherein a connecting piece (8) which is preferably formed in the shape of a ring or a disk, is provided between holding pipe (7) and coolant pipe section (6).

8. The cooling plate (1, 16) as claimed in one of claims 1 to 5, wherein a coolant pipe section (6) is formed as a single part and is provided with a flange which is secured to the cooling plate (1, 16).

9. The cooling plate (1, 16) as claimed in claim 8, wherein a holding pipe (7) - surrounding the coolant pipe section (6) - is secured to the flange.

10. The cooling plate (1, 16) as claimed in claims 1 to 9, wherein the pipe sections (6) for coolant to flow in and out are made from the same material as the cooling plate (1, 16).

11. The cooling plate (1, 16) as claimed in claims 1 to 5, wherein a pipe section (17) is designed both as a holding pipe (7) and as a coolant pipe section (6).

12. The cooling plate (1, 16) as claimed in one of claims 1 to 9, wherein the pipe sections (7, 17) for

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coolant to flow in and out are made from the same material as the holding pipes (7).

Abstract

The invention relates to a cooling plate (1, 16), consisting of copper or low-alloy copper alloy, for metallurgical furnaces provided with an outer furnace casing plate (2), having at least one, preferably at least two, coolant passages (5) which run inside the cooling plate (1, 16), coolant pipe sections for coolant to flow in and out being led to the outside through the furnace casing plate (2). Holding pipes which are provided with holding disks outside the furnace casing plate (2) and fix the cooling plate (1, 16) in the direction of the interior of the furnace are fixed to the cooling plate (1, 16). The holding pipes and holding disks are preferably made from steel.